

Phinney's Harbor Subwatershed

Bourne, Cape Cod, Massachusetts

The Phinney's Harbor Subwatershed is located in Bourne with its easternmost portion in Sandwich. It has an area of 2,400 acres. The system includes a moderately well flushed outer harbor and an inner harbor tributary embayment, Back River and Eel Pond. Phinney's Harbor is now semi-enclosed due to the construction of a long dike out to Hog and Mashnee Islands, but was completely open to the bay at the beginning of the last century. The harbor has a mean depth of two meters with shallow marginal areas and a depth of five meters in the central portion of the harbor. It contains 536 acres of estuary. Although eelgrass is present in the system, there are reports of some die-offs. Eel Pond and Back River are shallow and some of their areas drain completely at low tide, leaving tidal flats. There are 85 acres of salt marsh in the system (Coalition for Buzzards Bay, Baywatchers II Report, 1999).

This subwatershed contains the Bourne Back River Area of Critical Environmental Concern (ACEC). The ACEC was designated in 1989 and is 1,850 acres in size. Most of the marshes, tidal flats, and freshwater wetlands within this area are undeveloped and serve as habitat to a large array of shellfish, finfish, amphibians, reptiles, birds, and mammals. The area contains at least three known state-listed rare and endangered species, including osprey, spotted turtle, and diamondback terrapin.

According to Division of Marine Fisheries Sanitary Surveys, Back River is conditionally approved for shellfishing and the open season is getting shorter. Research has shown that the additional closing time is not related to rain events. Mashnee Island has been downgraded to conditionally approved for shellfishing. The sanitary survey detected no visible discharges. However, the water quality impacts could be caused by birds as there are many rocks in the area on which birds can land. There is a conditionally approved area at the end of Worcester Avenue over to Toby's Island, despite the town's remediation work in the area.

Most of the nitrogen in the system comes from the Back River and Eel Pond area. This is a small amount, though, as the system is at approximately one-sixth of its critical nitrogen load and is projected to be at less than one-quarter even at buildout. The area from Arthur Avenue to Toby's Island, however, does occasionally experience poor water quality due to bacteria contamination and is seasonally closed to shellfishing. Development within the watershed is primarily in the near shore region. Almost two-thirds of the upland is currently forested, and 39% of that forest is within the Massachusetts Military Reservation. Almost two-thirds of the lands available for development have already been used. Residential development accounts for nearly three-quarters of embayment loadings of nitrogen (Baywatchers II Report, 1999).

Past oil, fuel, chemical, and hazardous waste disposal activities on the Massachusetts Military Reservation have created groundwater pollution plumes, one of which is projected to flow into this watershed. The Air Force Center For Environmental Excellence (AFCEE) is investigating and addressing this groundwater pollution. In the spring of 2002, the Town of Bourne decided to join the Upper Cape Water Supply Cooperative after three of its six public water supply wells were closed due to contamination from the Massachusetts Military Reservation. The military funded a pipeline linking the Bourne district water main to the Upper Cape Water Supply in June 2002.

Stewards:

- The Coalition for Buzzards Bay (www.savebuzzardsbay.org)

Studies conducted in the watershed:

- Buzzards Bay Comprehensive Conservation and Management Plan. May 1990. Buzzards Bay Project National Estuary Program.
- Baywatchers II. Nutrient related water quality of Buzzards Bay embayments: a synthesis of Baywatchers monitoring 1992-1998. The Coalition for Buzzards Bay. December 1999.
- Cape Cod Nutrient Loading Study – Back River. Conducted by Tetra Tech. Study developed critical nitrogen loads, conducted a flushing analysis, and developed watershed nitrogen management options to reduce nitrogen loads.
- Atlas of Tidally Restricted Salt Marshes – Buzzards Bay Watershed, Massachusetts. 2002. Buzzards Bay Project National Estuary Program.
- Atlas of Stormwater Discharges in the Buzzards Bay Watershed, Final Draft. June 2002. Buzzards Bay Project National Estuary Program.
- The Town of Bourne contracted with Applied Coastal Engineering to complete a flushing study.
- The Back River/Eel Pond system was selected as a priority area for the Estuaries Project – Southeastern Massachusetts Embayment Restoration, funded by the state and UMass Dartmouth. The goal of the project is to develop critical nutrient loading thresholds for each embayment to aid in water resources planning and which will support federal requirements for the development of Total Maximum Daily Loads for impaired surface waters.

Who is collecting water quality data and where:

- The Coalition for Buzzards Bay – Baywatchers. Sample for temperature, water clarity, salinity, dissolved oxygen, chlorophyll a, nitrogen, and phosphorus. Six sites in Phinney's Harbor, four sites in Eel Pond, two sites in Back River.
- The United States Geological Survey maintains a stream flow gauge in Eel Pond/Back River, collecting data that will be used in the Massachusetts Estuaries Project.

Management actions taken:

- The town has done stormwater remediation work along Eel Pond.
- Proposed Gray Gables Salt Marsh Restoration under the Massachusetts Wetlands Restoration Program. This severe tidal restriction and degraded wetland is in the Bourne Back River ACEC. Project goal is to help prevent the shoaling presently occurring at the culverts inlet. Likely to be the next salt marsh restoration undertaken by the Town of Bourne after Wings Neck. Planning may begin by the end of 2002.

Subwatershed facts: (For data sources see Appendix)

- 21 E sites: none
- Solid waste sites: 2
- Zone IIs located in this watershed: 1
- Percent of the undeveloped land that is protected (according to 1985/1990 data): 10.4%
- Acres of existing wetlands: 111
- Certified vernal pools: 1
- Named freshwater ponds: Mill, Clay, Donnelly, Little Halfway
- Named rivers or creeks: Back River
- Shellfish growing areas: Back River and Eel Pond are conditionally approved. Much of Phinney's Harbor, Little Bay, Toby Island, and Mashnee Dike is prime shellfishing habitat.

- This watershed contains Natural Heritage and Endangered Species Program (NHESP) Estimated Habitats of Rare Wildlife.

Priorities:

- Develop critical nutrient loading thresholds in Eel Pond and Back River to aid in water resources planning and the development of TMDLs.
- Conduct a biological survey within the Bourne Back River ACEC.
- Conduct Gray Gables Salt Marsh Restoration Project to restore 8 acres.
- Investigate the reasons for reduced water quality that causes shellfish bed closures in Back River.
- Examine water quality impacts due to birds at Mashnee Island.
- Clay, Donnelly, and Deep Bottom Ponds need volunteers to participate in the Pond and Lakes Stewardship Project (PALS), measuring water quality and other characteristics of the ponds.
- Conduct periodic evaluation of the eelgrass beds within the outer Harbor.
- Acquire open space. Parcels considered a priority for acquisition for water supply protection and development: Bourne Tracts 5, 9, 10, 15, 16, 18, 22, 23, and 30 were ranked as having medium or high water supply development potential in the Cape Cod Commission's *Priority Land Acquisition Assessment Project* (April 1999). These tracts are located throughout the Town of Bourne.
- Implement those salt marsh restoration projects identified in the 2002 *Atlas of Tidally Restricted Salt Marshes – Buzzards Bay Watershed, Massachusetts* that have been evaluated and prioritized by the town. Sites in this subwatershed are BN9, BN10, BN29, BN30, BN11, and BN6.

Recreation:

Camping areas:

- Bayview Campground

Pathways and trails:

- www.capecodcommission.org/pathways/trailguide.htm

Public access:

- www.state.ma.us/dfwele/pab/pabSEmap.htm

Golf courses:

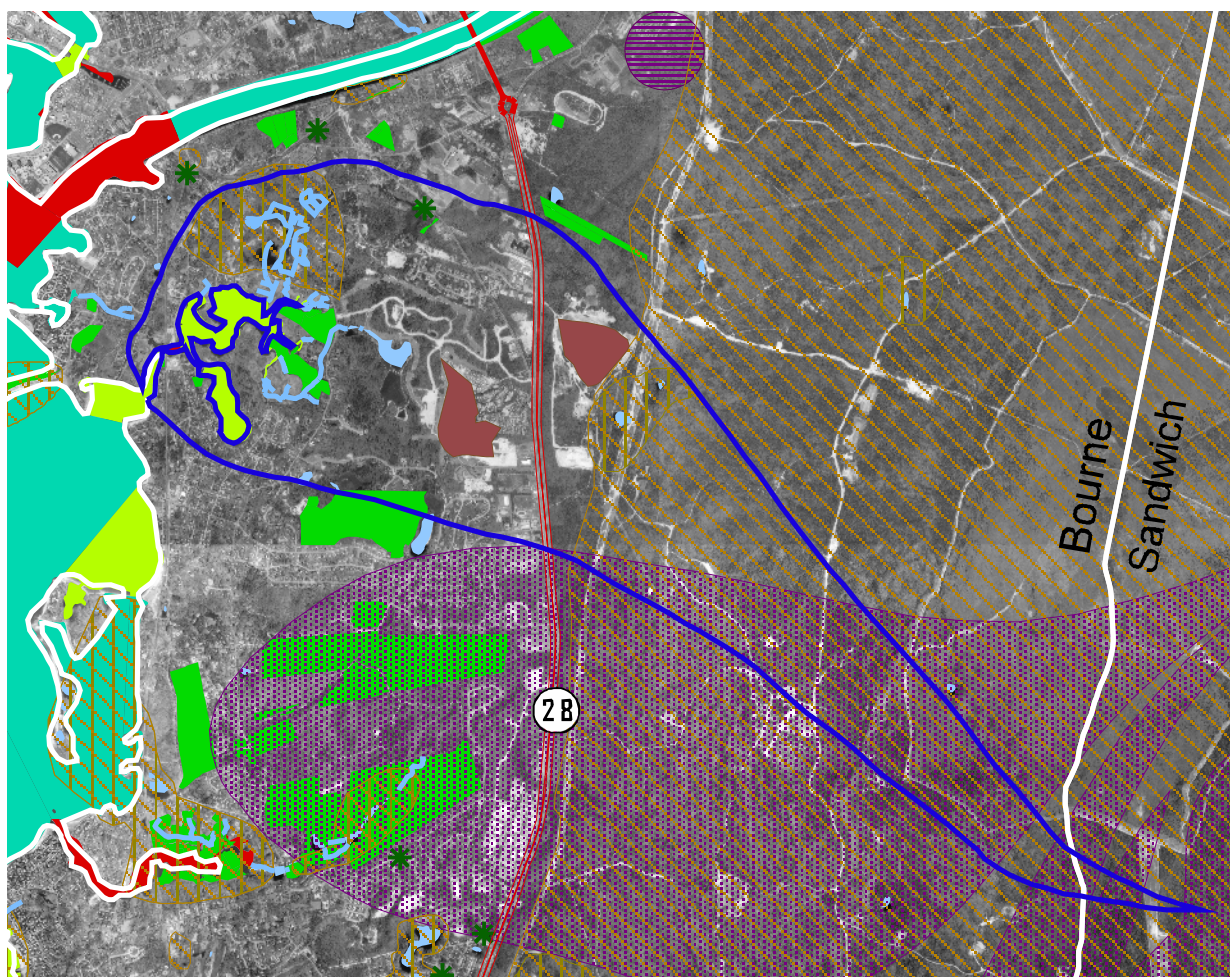
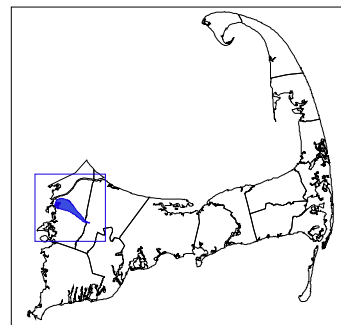
- Brookside Golf Club

Public beaches and landings:

- 400 moorings and slips (not including Little Bay)

Phinney's Harbor

Bourne, MA



Watershed Resources



0 0.5 1 1.5 Miles

Natural Heritage and Endangered Species Program Data

- Certified Vernal Pool
- Priority Habitats of Rare Species
- Estimated Habitats of Rare Species

Groundwater Protection Areas

- Interim Wellhead Protection Area
- Zone II
- Solid Waste Facility

Watershed Boundary

Anadromous Fish Run

Shellfish Growing Areas

- APPROVED
- CONDITIONALLY APPROVED
- MANAGEMENT CLOSURE
- PROHIBITED
- RESTRICTED

Open Space

Streams

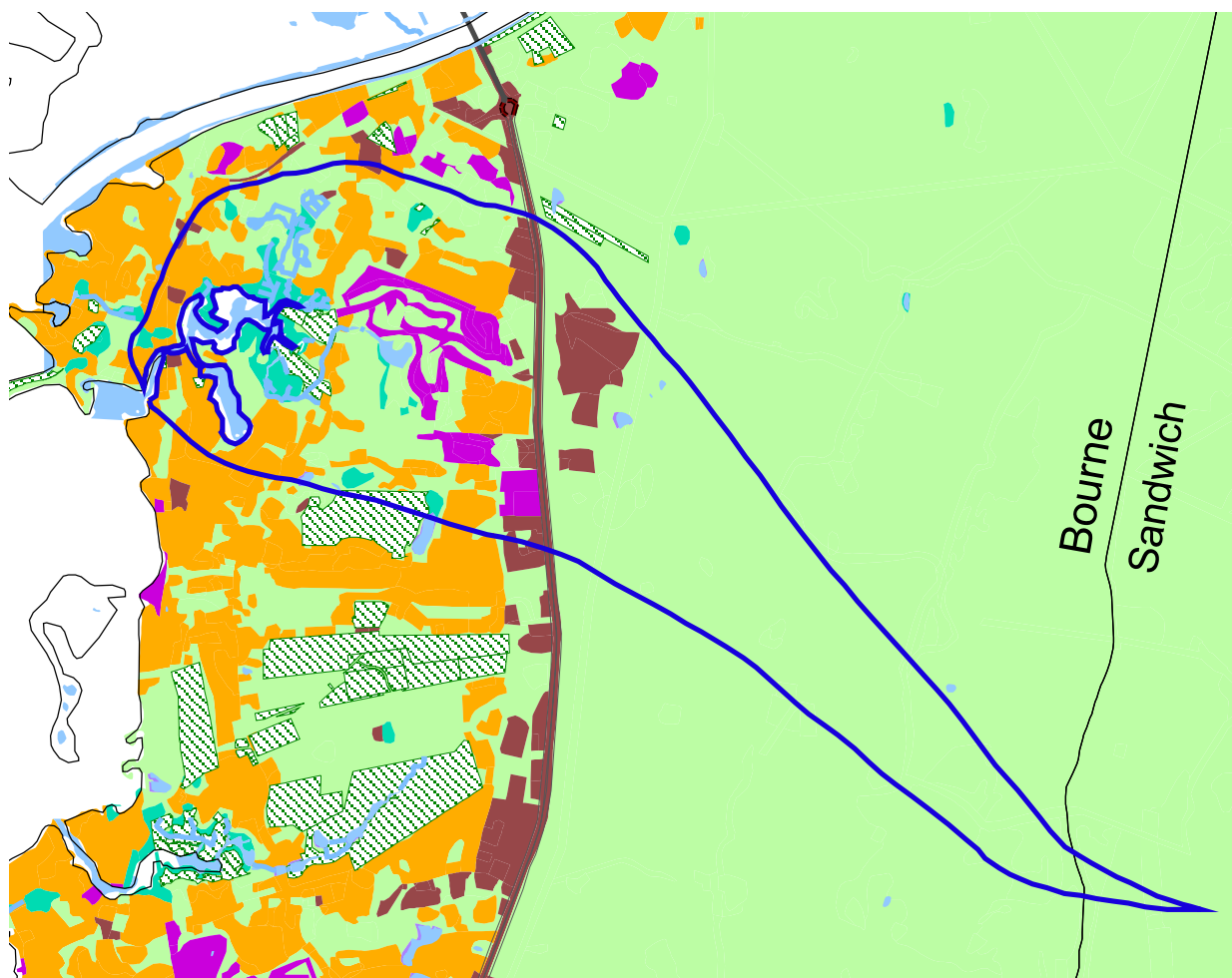
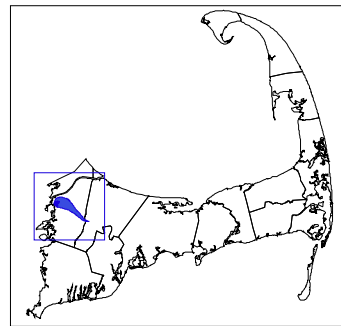
Ponds

Roads



Phinney's Harbor

Bourne, MA



Land Use



0 0.5 1 1.5 Miles



Land Use

- non-residential developed
- open land
- recreation
- residential
- water
- wetland

- Streams
- Ponds
- Watershed Boundary
- Protected Open Space

